

Claims

What is claimed is:

- 5 1. A method of executing one or more self-tests on a data storage device comprising:
 selecting one or more host programmable tests stored in memory in the data storage device by
 setting data in a first log in memory of the data storage device;
 setting parameters for execution of the one or more host programmable tests by setting one or
 more values in a second log in memory of the data storage device;
 executing the one or more host programmable tests on the data storage device; and
 storing results of the one or more host programmable tests in a third log in memory of the
 data storage device.

- 15 2. The method of claim 1, wherein one test of the one or more host programmable tests is a
 Position Error Signal (PES) test comprising:
 selecting a read/write head of the data storage device and a track of a storage medium in the
 data storage device to be tested, the selected track accessible by the selected
 read/write head;
 receiving a host request for servo data from the selected track;
 20 collecting PES data from the selected track while reading the requested servo data; and
 storing the collected PES data in a log in memory of the data storage device.

3. The method of claim 1, wherein one test of the one or more host programmable tests is a head error rate test comprising:

selecting a range of addresses to be tested on a storage medium in the data storage device;
collecting head error rate data for the range of addresses selected; and
5 storing the head error rate data and a test complete status in a log in memory of the data storage device.

4. The method of claim 1, wherein one test of the one or more host programmable tests is a read verify reserve data track test comprising:

10 performing a sector-by-sector read of reserve track data on a storage medium of the data storage device;

determining whether an uncorrectable error has been detected during the sector-by-sector read of the reserve track data on the storage medium;

responsive to determining one or more uncorrectable errors have been detected, storing a 15 number of errors and an offset value for each error in a log in memory of the data storage device; and

storing a test complete signal in the log in memory of the data storage device.

5. The method of claim 1, wherein one test of the one or more host programmable tests is a clear logs test comprising:

20 determining whether a test key stored in a first log of a plurality of logs in memory of the data storage device has been set; and

responsive to determining that the test key has been set, clearing all logs in the plurality of logs in memory of the data storage device and erasing the test key.

6. The method of claim 1, wherein one test of the one or more host programmable tests is an
5 erase drive test comprising:

determining whether a test key stored in a first log in memory of the data storage device has
been set;

determining whether an erase start address and an erase end address stored in a second log in
memory of the data storage device are within a range of addresses available on the
10 data storage device; and

responsive to determining that the test key has been set and the erase start and erase end
addresses are within a range of addresses available on the data storage device, erasing
a storage medium of the data storage device in the range specified by the erase start
and erase end addresses and erasing the test key.

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7. The method of claim 1, wherein one test of the one or more host programmable tests is a
rewrite test comprising:

determining whether a test key stored in a first log in memory of the data storage device has
been set;

20 determining whether a rewrite start address and a rewrite end address stored in a second log
in memory of the data storage device are within a range of addresses available on the
data storage device; and

responsive to determining that the test key has been set and the rewrite start and rewrite end addresses are within a range of addresses available on the data storage device, rewriting data on a storage medium of the data storage device with a value stored in a third log in memory of the data storage device in the range specified by the rewrite start and rewrite end addresses and erasing the test key.

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8. The method of claim 1, wherein executing the one or more host programmable tests on the data storage device comprises executing the one or more host programmable tests in a captive mode.

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9. The method of claim 1, wherein executing the one or more host programmable tests on the data storage device comprises executing the one or more host programmable tests in an offline mode.

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10. A data storage device comprising:

one or more read/write heads;

a storage medium accessible by the one or more read/write heads;

a processor coupled with the read/write heads to access data on the storage medium; and

5 a memory connected with and readable by the processor and having stored therein one or
more host programmable tests overwritten onto vendor specific portions of a self-
monitoring program and executable by the data storage device while the data storage
device is connected with a host.

10 11. The data storage device of claim 10, wherein the self-monitoring program is the Self-

Monitoring, Analysis, and Reporting Technology (SMART) program.

12. The data storage device of claim 10, wherein one test of the one or more host programmable

tests is a Position Error Signal (PES) test comprising:

15 selecting a read/write head of the data storage device and a track of the storage medium to be

tested, the selected track accessible by the selected read/write head;

receiving a host request for servo data from the selected track;

collecting PES data from the selected track while reading the requested servo data; and

storing the collected PES data in a log in the memory.

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13. The data storage device of claim 10, wherein one test of the one or more host programmable
tests is a head error rate test comprising:

selecting a range of addresses to be tested on the storage medium;
collecting head error rate data for the range of addresses selected; and
storing the head error rate data and a test complete status in a log in the memory.

5 14. The data storage device of claim 10, wherein one test of the one or more host programmable tests is a read verify reserve data track test comprising:
 performing a sector-by-sector read of reserve track data on the storage medium;
 determining whether an uncorrectable error has been detected during the sector-by-sector read of the reserve track data on the storage medium;
10 responsive to determining one or more uncorrectable errors have been detected, storing a number of errors and an offset value for each error in a log in the memory; and
 storing a test complete signal in the log in the memory.

15 15. The data storage device of claim 10, wherein one test of the one or more host programmable tests is a clear logs test comprising:
 determining whether a test key stored in a first log of a plurality of logs in the memory has been set; and
 responsive to determining that the test key has been set, clearing all logs of the plurality of logs in the memory and erasing the test key.
20 16. The data storage device of claim 10, wherein one test of the one or more host programmable tests is an erase drive test comprising:

determining whether a test key stored in a first log in the memory has been set;
determining whether an erase start address and an erase end address stored in a second log in
the memory are within a range of addresses available on the data storage device; and
responsive to determining that the test key has been set and the erase start and erase end
addresses are within a range of addresses available on the data storage device, erasing
the storage medium in the range specified by the erase start and erase end addresses
and erasing the test key.

5 17. The data storage device of claim 10, wherein one test of the one or more host programmable
tests is a rewrite test comprising:

determining whether a test key stored in a first log in the memory has been set;
determining whether a rewrite start address and a rewrite end address stored in a second log
in the memory are within a range of addresses available on the data storage device;
and
responsive to determining that the test key has been set and the rewrite start and rewrite end
addresses are within a range of addresses available on the data storage device,
rewriting data on the storage medium with a value stored in a third log in the memory
in the range specified by the rewrite start and rewrite end addresses and erasing the
test key.

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15 18. The data storage device of claim 10, wherein the one or more host programmable tests are
executable in a captive mode.

19. The data storage device of claim 10, wherein the one or more host programmable tests are executable in an offline mode.